

REMARKS/ARGUMENTS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-5, 7, 8, 10, 11, and 14-34 are pending in the present application, Claims 15-32 having been withdrawn as directed toward a non-elected invention.

In the outstanding Office Action, Claims 1-5, 7, 8, 10, 11, 14, 33, and 34 were rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement; Claims 1-3, 7, 8, 10, 11, and 33 were rejected under 35 U.S.C. §102(e) as anticipated by Masumoto et al. (U.S. Patent No. 7,046,833, hereinafter Masumoto); Claim 4 was rejected under 35 U.S.C. §103(a) as unpatentable over Masumoto in view of Qian et al. (U.S. Patent No. 6,195,450, hereinafter Qian); Claim 9 was rejected under 35 U.S.C. §103(a) as unpatentable over Masumoto in view of Chaddha (U.S. Patent No. 6,360,019); and Claims 14 and 34 were indicated as including allowable subject matter if amended to overcome the rejection under 35 U.S.C. §112, first paragraph.

Applicant thanks the Examiner for the indication of allowable subject matter.

Applicant also thanks the Examiner for the discussion had with Applicant's representative on February 6, 2008. During the discussion, it was pointed out that an English translation of the priority document was filed, to perfect the claim of priority to PCT/JP01/03362 and overcome the outstanding rejections based on art. Copy of this translation is found in file wrapper in PAIR. During this discussion, the Examiner suggested a personal interview to discuss the outstanding rejections. The Examiner is encouraged to contact the undersigned, who would be happy to discuss the outstanding rejections with the Examiner. Also, additional explanation as to where the specification describes the claimed subject matter is provided herein.

With respect to the rejection of 1-5, 7, 8, 10, 11, 14, 33, and 34 under 35 U.S.C. §112, first paragraph, Applicant respectfully traverse this ground of rejection. Below, areas of the specification that describe features recited in the pending claims are identified. However, the citations provided below are not intended to replace a full reading of the specification, but merely highlight portions of the specification to facilitate a faster review of the entire specification. The specification discusses many mathematical expressions that may not be easily understood if read in isolation. Further, the citations provided are not an exhaustive list of support for the pending claims, as other non-listed sections of the specification may support the claims as well.

With respect to Claims 1, 2, and 33, the outstanding Office Action states “there is no support of the limitation ‘decision means for deciding a similarity between a first pixel and a second pixel of an image based on a plurality of images obtained by photographing an identical subject at different times.’” Applicant respectfully traverses this ground of rejection.

Initially, Applicant notes that there is literal support for this claim element in original Claim 6. Furthermore, Applicant’s Fig. 3 shows equipment used to perform the calculations discussed in the specification.

Page 15, line 13 to page 16, line 4 of the originally filed specification describe how to determine whether a pixel x and a pixel y are similar, wherein the pixels are part of a set of pixels defined by $N(x)$. This section describes specifically states “it gives a concrete numerical value indicating the degree to which the pixel x and pixel $y \in N(x)$ are similar in any sense....”

The Office is also referred to the discussion in the specification around page 17, lines 8-9 (which further describes the similarity between pixels), page 22, lines 22-24 (which describes the use of a plurality of images), page 24, line 24 to page 25, line 15 (which

describes obtaining a plurality of images by scanning a subject a plurality of times), page 35, line 10 to page 36, line 15 (which describes determining if two pixels are similar), and page 77, lines 7-9 (which describes iterative photographing a subject to obtain a plurality of images), for example.

Applicant respectfully submits that a person of ordinary skill in the art, without undue experimentation, would be able to make and use the claimed “decision means for deciding a similarity between a first pixel and a second pixel of an image based on a plurality of images obtained by photographing an identical subject at different times” based on at least the above-noted sections in the specification. The equations discussed in the specification show an example of how the processing equipment in Fig. 3, for example, can process image data and perform the requisite calculations.¹

With respect to Claim 14, the outstanding Office Action states there is no support for “average means for averaging values of the first pixel and the second pixel when the numerical similarity is high in the numerical means, and for not averaging the first pixel value and the second pixel value when the determined similarity is low.” Applicant respectfully traverses this rejection.

Initially, it is noted that original Claim 14 provides literal support for this element of Claim 14.

Equation 2 at page 6 of the originally filed specification is used to take a weighted average of pixel x and pixel y. Page 21, lines 10-26 describes that the weighting used in the averaging depends on the goodness of the fit between each pixel x and a desired pixel y. When pixels x and y are similar (i.e., when numerical similarity is high), pixel y is caused to contribute to the averaging process (i.e., a non-zero weight is used). When pixels x and y are dissimilar (i.e., when the numerical similarity is low), pixel y may be ignored (i.e., a weight of zero is used, which means that pixel y does not contribute to the averaging process). In

¹ Specification, pages 38, lines 13-22.

other words, there are situations disclosed in the present application where no averaging is performed if when the determined similarity is low.

Furthermore, the outstanding Office Action also rejects Claims 5 and 34 under 35 U.S.C. §112, first paragraph, along with Claim 14. Claims 5 and 34 do not recite the same elements as does Claim 14. However, Claims 5 and 34 are similarly supported by the above-noted portions of the specification.

It is respectfully submit that a person of ordinary skill in the art, without undue experimentation, would be able to make and use the inventions defined by Claims 5, 14, and 34 based on the above-noted sections in the specification. The equations discussed in the specification show an example of how the averaging is calculated by the equipment shown in Fig. 3, for example.²

With respect to Claim 11, the outstanding Office Action states there is no support for “wherein the first image is obtained by subjecting the image to averaging processing with the average means and the second image is obtained by subjecting the image to processing different from the averaging processing.” Applicant respectfully traverses this rejection.

This element of Claim 11 is discussed with respect to Applicant’s Figs. 4A to 4C, and page 36, line 16 to page 41, line 5 of the originally filed specification. Beginning at page 36, line 16, a first image (of K static images) is subject to the averaging processing to generate weighting factors. A second image is subject to a different process to compute scalar values of the pixels in the second image.

With respect to Claim 11, the specification states

Meanwhile, in the MRI equipment, different physical parameters can be brought into images by altering a pulse sequence. The “pulse sequence” signifies the combination of the sequence of applying RF pulses and a gradient magnetic field, intensities and time periods for applications, and a quiescent time period, and multifarious images can be obtained by changing the pulse sequence. As a very small number of

² Specification, pages 38, lines 13-22.

examples of the pulse sequence which is typically used, there have been known ones which are called “T2*-weighted image”, “T1-weighted image” and “proton-density image” prefixed by the physical parameters that contribute most to the contrasts of the images. Anyway, notwithstanding that a patient undergoes no change, ***the different images are obtained depending upon the pulse sequences***, with the result that a plurality of sorts of images are, in effect, obtained.

More concretely, assuming that the patient has been radiographed K times while the pulse sequence is being changed, a vector $v(x) = (v1(x), v2(x), \dots, vK(x))$ can be constructed by arraying scalar values in the pixel x of the images obtained by the K times of radiographing. Also in this case, accordingly, noises can be suppressed in such a way that the coherent filter is applied by utilizing quite the same means as in the dynamic coherent filtering, as in the case of the averaging.³

This section of the specification shows that different images can be obtained from the same original data, if different processing is done on the original data. The different scalar values change the averaging process. Thus, the second image can be obtained from a processing different than the averaging processing used to obtain the second image.

Applicant respectfully submits that a person of ordinary skill in the art, without undue experimentation, would be able to make and use the invention defined by Claim 11 based on the above-noted sections in the specification.

In view of the above discussion, Applicant respectfully requests that the rejection under 35 U.S.C. § 112, second paragraph, be withdrawn.

With respect to the rejections of independent Claims 1, 2, 14, 33, and 34 under 35 U.S.C. § 102(e) as anticipated by Masumoto, Applicant notes that Masumoto has a filing date of May 21, 2001. This filing date of Masumoto is later than Applicant’s foreign priority date of April 19, 2001. Therefore, to perfect priority and to overcome all rejections based on Masumoto, an English translation of PCT Application PCT/JP01/03362, filed on April 19, 2001, and a statement from the translator that the translation is accurate, was previously

³ Specification, page 50, line 24 to page 51, line 27, emphasis added.

submitted and is available in the file wrapper of PAIR. Consequently, Masumoto is not prior art and all rejections based on art are traversed.

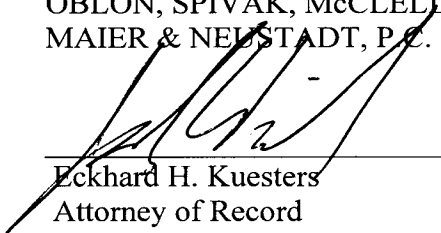
Consequently, in light of the above discussion, the present application is believed to be in condition for allowance and an early and favorable action to that effect is respectfully requested.

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